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FOREST INSECT INVESTIGATIONS

FOREST INSECT CONDITIONS IN THE MADISON NATIONAL FOREST WITH RECOMMENDATIONS FOR CONTROL 1930

by
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INTRODUCTION

The purpose of this report is to depict the present status of the mountain pine beetle (Dendroctonus monticolae) infestation within the lodgepole pine forests of the Madison National Forest. At the request of the Regional Forester of this Region, the writer assumed the responsibility of assimilating all available data bearing upon this project, as well as the submission of recommendations for control. Data for this report were secured by local forest officers of the Madison Forest and by officers of the Forest Service and Bureau of Entomology specially assigned to the survey. In this report all data have been used in the same form as submitted, though in some instances the writer's reaction to conditions is somewhat adverse to that as shown by the data.

HISTORY OF RELATED PROJECTS

A brief history of related situations is submitted to assist the reader in visualizing the conditions that exist within the Madison National Forest at this time. During the years of 1926, 1927 and 1928, control measures were conducted against an epidemic of the mountain pine beetle within the lodgepole pine stands of the Beaverhead National Forest. Though the protection of the Beaverhead timber was desired, the primary objective of this project was to prevent the spread of the insect outbreak into the more valuable commercial and scenic forests to the south. During the summer of 1928 the reinfestation that occurred within the treated areas from the heavy blocks of infestation on the Bitterroot was so severe that the continuance of the project was deemed an unsound procedure and it was discontinued. Though no further work was to be conducted on the Beaverhead Forest, it was understood that there was to be no cessation in the attempt to prevent the spread of this epidemic into the more valuable forests to the south. Advantage was to be taken of the break in the timber stands occurring between the Beaverhead and Madison Forests, in the hopes that this timberless region would at least act as a partial barrier to the spread of the insects. Provision was also made for an annual survey of the Madison Forest, so that any infested trees occurring to the south of the so called barrier could be promptly located and treated. In 1929 only a few scattered, isolated groups of trees were located, and though action was taken to treat these trees they were considered as representing a normal infestation only. During August 1930, several rangers of the Madison Forest

reported red-tops occurring in such numbers as to indicate the presence of an infestation rather above a so called normal or endemic infestation. Subsequent to this discovery a more intensive survey was made of the infested areas for the purpose of securing an estimate of the 1930 infestation. The results of this survey follow:

SUMMARY OF SURVEY

The infested portion of the Madison Forest covered by this survey has been divided into three units, namely, Ruby Ranger District, Wall Creek Ranger District, and the Sheridan Ranger District. A brief description of these areas and the data secured by the survey for each of the units follow:

Ruby Ranger District

This unit constitutes the southwest portion of the Madison Forest, lying in the headwaters of the Ruby River and Blacktail Creek drainages. It is a rough, mountainous country, with approximately one third of the total acreage, or 70,000 acres, covered by timber. Areas of both lodgepole pine and white bark pine, broken by Douglas fir types, are scattered throughout the total acreage. The status of the infestation within the seven units of this district, as revealed by the data secured, is shown by the following table:

RUBY RANGER DISTRICT

Unit	Acres of Susceptible Timber	Acres of Sample Strip	1930 Attacked Trees per Acre	Total Number 1930 Attacked trees per Unit
#1 Idaho	2850	116	.28	798
#2 Greenhorn	3950	184	.13	513
#3 Warm Springs	3950	190	.14	553
#4 Snow Crest	2850	136	.24	684
#5 West Fork Ruby & Devil's Hole	6400	157	.15	960
#6 Ruby	12,400	397	.035	434
#7 Black Trail	20,550	383	.185	3525
	54,950	1563		8761

These data show a rather light infestation for the entire district, with a rather heavy concentration in the Black Trail unit. Some of the acreage of this unit is outside of the forest boundary, lying along the west fork of the Black Trail Creek drainage, and will need to be included in any thoughts of control for this district. Furthermore, to the southwest along the Black Trail Creek drainage there are additional areas of pine harboring a rather heavy infestation. These areas will be discussed under the proposed recommendations for control within this district.

Wall Creek Ranger District

The divide between the Ruby River and the Madison River separates the Wall Creek District from the Ruby District. The major portion of this district lies within the drainage of the West Fork of the Madison

River. The terrain is rough and rather inaccessible, there being but few roads and trails. There are bodies of white bark pine and lodgepole pine, broken by both open ranges and areas of Douglas fir, scattered throughout the district.

The following tabulation shows the existing situation as revealed by the survey data:

BALL CREEK RANGER DISTRICT

Unit	Acres of Susceptible Timber	Acres of Sample Strip	1930 Attacked Trees per Acre	Total Number 1930 Attacked Trees per Unit
Cascade	1775	---	.96	1704
Lolo	2430	---	.14	340
Upper West Fork	2760	---	.19	524
Meridian	60	---		169
	7025			2737

These data show an average of .39 infested trees per acre for the entire unit. This infestation is heavier than on the other districts of the forest, and well above that would be considered as a normal infestation.

Sheridan Ranger District

This district lies to the north of the Ruby District, and includes that portion of the forest known as the Tobacco Root Mountains. The Sheridan District is exceedingly rough and steep, with many portions being very inaccessible.

A table showing the results of the survey in this district follows:

BOULDER RANGER DISTRICT

Unit	Acres of Susceptible Timber	Acres of Sample Strip	1930 Attacked Trees per Acre of Strip	Total 1930 Attacked Trees per Unit
Perry Canyon	898	40	.12	108
Mill Canyon	1520			60
Bell Canyon	2610	39	1.00	2010
Dry Boulder	127	72	.01	11
Hulbert & Binby	932		.011	21
Bear Gulch	447			25
Wisconsin Creek	4739	144	.07	110
Mill Creek	4251		.16	280
Ramshorn Creek	2492	92	.12	299
Riven & Harris Creek	802	45	.26	208
California	648	28	.1	65
S. F. Granite	1568			10
Granite & Tributaries	2229	80	.06	134
South Boulder	3534	96		0
Bone Basin	0			0
Little Bear Creek	883			30
Dry Gulch & Goodrich	197	32		0
Indian Creek	2460	16		1
Horse & Carreat Creeks	184	16		0
	31,866	700		3362

On this portion of the forest there is an average infestation of .10 trees per acre for the total of 31,866 acres of susceptible timber. Though in many of the units the infestation can not be considered as being above a normal condition, there are other areas that are apparently harboring a rather severe situation.

From the map accompanying this report it will be seen that the most serious infestations exist in the Black Tail drainage and in the northern portion of the Sheridan District. It is a rather significant fact that the Black Tail drainage faces the heavy infestation of the Beaverhead, while the northern portion of the Sheridan District is but a few miles from a heavily infested area of the Deerlodge. It would seem that this fact could be offered as an explanation for the occurrence of the heavy infestation in these two areas of the Madison.

RECOMMENDATIONS FOR CONTROL

When factors associated with this problem are considered, the formulation of a plan of control for the Madison National Forest becomes a difficult task. This difficulty rests in one's inability to foresee the future of this outbreak as well as to measure the intangible values at stake. Justification for the expenditure of large sums of money for insect control on the Madison must rest primarily upon the protection that will be given to the commercial forests adjacent to West Yellowstone, and to the highly prized scenic timber stands of Yellowstone Park. Though one can not be sure that the existing infestation within the Madison will develop into an epidemic of such a magnitude that serious destruction will occur, it is necessary to assume that the chance of

such an occurrence is sufficiently strong to warrant the institution of control as a means of protecting the valuable forests at stake. Such a position is recognized as being a safety first policy, but one that is justified when past devastations are considered. The prosecution of a control project within the Madison will prove to be an expensive operation. The terrain is rough and inaccessible; timber stands consist of scattered bodies of timber that will require small and numerous camps; in many areas the trees are tall and will need to be felled for treatment; and the general infestation occurs as scattered trees throughout large acreages, requiring high spotting costs. Furthermore, under an assumption that this infestation is being fed from the Beaverhead epidemic, a program of control will of a necessity be a long drawn out procedure.

Before adopting a program of control it is well to attempt to visualize the devastation that will occur if an epidemic comparable to that which has spread through the Bitterroot and Beaverhead National Forests is allowed to develop within the areas at stake. Such insect outbreaks destroy in 5 or 6 years from 60-80 per cent of the trees, or a very large proportion of the trees above 8 inches in diameter. Such devastation not only destroys the commercial values of timber stands, but scenic forests are left in an unsightly condition. Such aesthetic scars are obliterated somewhat when the dead needles fall, permitting the green understory of smaller trees to be seen, though of course the standing snags detract materially from the beauty of the area. In 10-15 years these snags have all fallen, and a green though sparse forest remains, making it difficult to visualize from a distance the destruction

that has occurred. A depiction of the devastation resulting from such epidemics would not be complete unless the extremely serious fire hazard that is created by the fallen snags is included. These snags leave an impenetrable tangle of decaying logs and tops that last for several decades. This mass of debris constitutes a condition that makes the suppression of fires a difficult and sometimes impossible task. So in the justification of control for this region one must balance against the expense and uncertainty of the operation not only the commercial loss of timber and disfigurement of the scenic forest at stake but the extremely serious fire hazard that is created, and which will last for many years.

In the adoption of a control policy for the Madison the writer recommends that it be organized on the basis of a 100 per cent cleanup. The following plan has been formulated on such a foundation, as it is believed that a program of this character is the most economical to follow and offers the best chances of obtaining entomological success. Under such a program it will be necessary to go outside the boundaries of the National Forest into what is known as the Black Tail hills. This area of public domain adjoins the southwestern portion of the Madison, and is heavily infested. The inclusion of this area into the Madison units of control takes advantage of the widest portion of the potential barrier lying between the heavy infestation of the Beaverhead and the project under consideration. Attention should also be directed towards the south side of the Centennial Valley, as this region adjoins the northern boundary of the Targhee National Forest, where control is being conducted at this time. Though only one small infestation was located

in this region during the survey, it should be covered by control.

Control measures, with an estimate of the funds required for treatment, are recommended for the following areas:

	Estimate of Number of Trees	Funds Required
Ruby District Unit		
Units 1-7 incl.	8,761	$17,000
Block Tail Hills	11,600	23,000
Total	20,361	40,000
Bull Creek District		
Cascade	1,704	3,500
Lobo	340	700
Upper West Fork	524	1,000
Meridian	169	400
	2,737	5,600
Centennial Valley		
Price Creek	25	100
Sheridan District		
Perry Canyon	108	225
Mill Canyon	60	150
Bell Canyon	2,000	4,000
Wisconsin Creek	110	250
Mill Creek	280	360
Henshorn	295	600
Niven & Davis	208	100
California	65	150
Granite & Tributaries	139	300
Little Bear Gulch	30	100
	3,204	6,835
Grand Total for Project	26,017	51,935

It will be noted that of the $52,000 required for the control of the infested areas within and adjacent to the Madison Forest the sum of $23,000 is taken for the Black Hill hills, an area of public domain outside the forest boundary. As the timbered acreage of this area is not known, it is possible that the estimated number of trees may prove to be too high.

Of the total allotment requested, the sum of $40,000 is required for the Ruby District, and in any plan of control this portion of the forest must receive first consideration. Nothing can be said in favor of treating the light and scattered infestation throughout the central portion of the forest and allowing heavy centers to develop within an area immediately adjacent to the control units, to act as a source of reinfestation.

If funds are not available, and it is necessary to eliminate any portion of the forest from the project, the writer would recommend that the Sheridan District be dropped from consideration in 1931, reducing the estimate of funds to $45,700. In the adoption of such a plan it is understood, of course, that this district be again considered in the 1932 plans of control, and that steps be taken at that time to cover the infested areas with control measures.

Though it is believed that it would be an extremely ill advised procedure, the Bull Creek District could likewise be eliminated from the 1931 plans of control, if absolutely necessary, reducing the estimated cost of the project to $40,000. In the adoption of such a dangerous

plan, full consideration must be given to the area in the thought of control for 1932, and adequate provision made for the treatment of all infested trees, in the hopes that the ground lost in 1931 can be regained at that time.

In estimating the funds required for this project, the writer has tried to consider all factors having a bearing upon the matter. In some areas there are trees that can undoubtedly be treated in a satisfactory manner by the burning-standing method. However, a large per cent of the trees are of such height and so exposed to constant winds that it will be necessary to fell them for treatment. The spotting cost will be high if considered on a tree basis, as the infestation is badly scattered. Some of the units are inaccessible by roads, and the transportation costs will be high. It has been estimated that the cost of treatment will be approximately $2.00 per tree.

In conclusion the writer recommends that the sum of $52,000 be appropriated for the treatment of the infested trees within and adjacent to the Madison National Forest.

Respectfully submitted,

James C. Evenden
Entomologist

BEAVERHEAD AND MADISON COUNTIES

MONTANA

Legend: Scale, ½ in.- 1 Mile

Sheridan District -----
Ruby District ---------
Wall cr. District -----
Deerlodge District ----